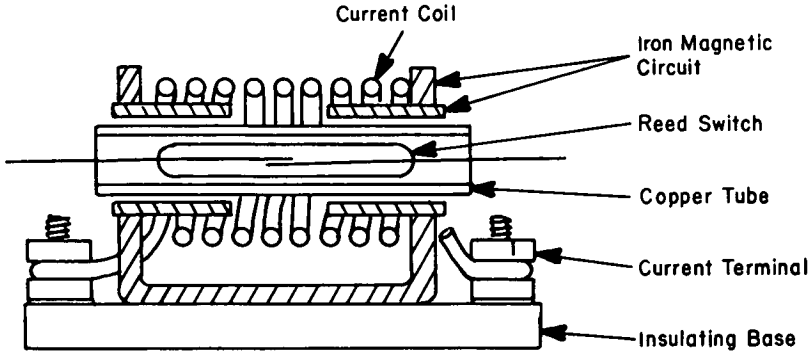
NASA TECH BRIEF

Manned Spacecraft Center

Current Switch Has Built-In Time Delay: A Concept



Cross Section of Current Switch

A novel switch concept provides a simple means of achieving an electromechanical time delay function. The switch consists of a reed-type circuit breaker enclosed by a copper tube; an electromagnetic coil is wound around the tube and the entire assembly is mounted on an insulating platform.

Eddy currents generated by the inductive reactance of the copper tube to sudden current changes act to oppose the force generated by the control field. The sealed reed switch is placed in an air gap so that the magnetic flux is concentrated through it; the surrounding copper tube intercepts the field passing through the switch. As the magnetic flux increases, currents induced in the copper oppose the flux entering the switch and delay its action.

The time delay is inversely proportional to the magnitude of the current above the operating point. Fine adjustment of the operating point is achieved by varying the air gap while the time delay is controlled by varying the thickness of the copper tube.

Characteristics are affected only by the geometry of the system so it is expected that the device will be very stable. Operating life is limited by the reed switch which is ordinarily rated for many millions of cycles.

Notes:

1. This invention is in the conceptual stage only. At the time of this publication no model or prototype exists.
2. No additional documentation is available. Specific questions may be directed to:

Technology Utilization Officer
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(continued overleaf)

Patent status:

No patent action is contemplated by NASA.

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